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Locomotor responses and neuron excitability in conditions of haloperidol blockade of dopamine in invertebrates and vertebrates

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Abstract

Levels of movement activity were used to identify two groups of rats: Those with high- and low-activity levels. Blockade of dopamine receptors with haloperidol led to suppression of locomotor activity in both groups of rats; in common snails, haloperidol decreased the rate of locomotion. The excitability of spinal centers in rats decreased 5 min after single i.v. injections, with gradual recovery seen by 30 min. Chronic administration of haloperidol suppressed post-tetanic potentiation of the H response in the gastrocnemius muscle of spinal rats. Prolonged use of haloperidol induced significant hyperpolarization of the membrane potential of command neurons in common snails and increased the action potential generation threshold. Selective pharmacological exclusion of the brain dopamine system was found to lead to decreases in the excitability of defined neurons in snails and the spinal motor centers in rats, also producing impairments in locomotor responses in these animals. © 2006 Springer Science+Business Media, Inc.

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Keywords

Dopamine, Gastrocnemius muscle reflex H response, Haloperidol, Locomotor activity, Membrane potential, Neuron excitability, Threshold potential